PROTO-INTERIOR SALISH VOWELS

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0. Interior Salish languages have been noted by many as a distinctive subgroup of the Salish family. Phonological systems are nearly identical, and cognates abound. Although their grammatical structures are quite distinct, the interior languages have more in common with each other than any one has with the non-interior languages (i.e., Coast Salish, Tillamook, and Bella Coola). The same is true of vocabularies.

Seven or eight distinct languages comprise Interior Salish. (1) Lillooet, (2) Shuswap, and (3) Thompson are spoken in south central British Columbia. (4) Colville is spoken by the Okanogan, Southern Okanogan, Methow, Nespolem, Sanpoil, Colville, and Lakes bands to the south of the former in British Columbia and in Okanogan and Ferry Counties in Washington. (5) Columbia is spoken by Indians who formerly lived along the Columbia River from just below the mouth of the Methow River to approximately the present community of Vantage, and along the Wenatchee River (with hunting and gathering territories well into the Cascade Mountains on the west and the
Columbia Basin on the east. (6) Spokane, which remains unstudied, is spoken along the Spokane River, with a probably closely related group on the Colville River near Chewelah. It is not yet known how distinct Spokane is from the next language to the east, (7) Kalispel-Flathead. The Kalispel and the Flathead tribes, plus the smaller Pend d'Oreille group, speak nearly identical dialects of one language. Their former territory extended from Pend d'Oreille County in Washington as far into Montana as Helena. (8) Coeur d'Alene, now nearly extinct (it is the Interior Salish language with the fewest remaining speakers), was spoken in the area west and south of Spokane. 3

As stated, the phonological systems of these languages are nearly identical. For consonants, all have p p t c c k w k w q q q w q w ? s x w x x h m m n n l l y y w w. All but Cr have additionally h (which there has merged with t), and all but Li, Sh, and Th have t (which in these three has merged with h). Sp, Ka, and Cr have c c s which correspond regularly to k k x respectively in Li, Sh, Th, Cv, and Cm (it should be noted that in at least Cm and Cv c c s are more commonly alveopalatal than alveolar, thus sounding more like the Sp, Ka, Cr c c s series than the cognate c c s series). In addition, Cm, Cv, Sp, Cr have r r (which have merged with l l elsewhere); Cr has b d g w corresponding to respectively p y y w elsewhere; Li, Th, Cv, Cm, Cr have pharyngeals ʃ ʃ w ʃ w, and Cm has an additional voiceless pair ʰ ʰ w, all of which have disappeared (or nearly so) from Ka; Sh has y; Li has z. With few and irregular exceptions other than those noted, like consonants are cognate in all languages.

Vowel systems are also similar, but this time cognacy is not so
straightforward. It is these divergencies with which this paper will deal. Because of availability of data, and because these two have developed the Proto-Salish vowel systems in two different directions typical of one or another IS language, Cm and Cr were used as the basis of comparison for hypothesizing the reconstructed vowel system of Proto-Interior Salish. Cognates from Ka, Sp, and Cv are included when available. Although data are available on Ka from Vogt's work, no consistent attempt was made to incorporate Ka material in this paper because of the added complexities and amount of data which would have had to be dealt with. Since cognates from CS languages are fewer and more difficult to locate, little attempt was made at this time to compare Cm or Cr extensively with any coast language (although a few correspondences from Kinkade's field notes on Upper Chehalis (Ch) are given). An unexpected side result of these comparisons was the reconstruction of a PIS ablaut system, which will be discussed below. It is believed that the vowel system reconstructed here will prove to be derivable with few emendations into the other IS languages.

1. Cr vowels are i a e a c u e. Of these, i, e, and e are marginal in that i and e are primarily positional variants of i, and e is principally epenthetic or the unstressed member of alternating pairs i-ø, e-ø, a-ø. ø also seems to be marginal and infrequent, but its status is unclear (it is commonly a positional variant of u). This leaves i a u as the basic vowels of Cr, and of these a has a somewhat restricted distribution.

Cm has i a u ø. ø has been noted occasionally, but should probably not be considered primary. This seems to be the more conservative lan-
guage phonologically, and we reconstruct these same four vowels for PIS, although not all correspondences are one to one (it is not possible to detect patterns of change from a PIS system containing the same vowels as Cr into Cm; the reverse is true, and is the assumption of this paper).

Ka, according to Vogt, has i e a o u stressed, and the same (short and long) plus a unstressed.

2. It was noted already in 1926 by Boas and Haeberlin that some IS languages had shifted a to i: "The most important vowel shift is that from a to i (e) in the inland dialects. . . . The most frequent a-i shift is that in which Lill, Thom, Shus, Spok, and Clum have a while Okan, Spoi, Clvi, Lake, Kali, Pd'O, and Cd'A have i (e)" 7 They also noted that there are exceptions to this shift: "In spite of a number of exceptions this soundshift is remarkably constant. It must be remembered that in many cases an i or a remains in all the dialects. It is impossible to determine from our material why in these cases the vowel has not been affected by the a-i change." 8 The majority of these exceptions will be explained below.

Another problem encountered by Boas and Haeberlin was what they believed was an opposite shift: "There are a number of words which show in the inland dialects an a-i sound-shift which runs in an opposite direction to that described above. That is to say those dialects which have a in the first type of a-i shift have i (e) in this second type and vice versa." 9 The difficulty with this particular shift is that many of the vowels are apparently misrecorded. All examples cited have been recorded in Cm by Kinkade as having e (often of a rather high variety, but quite distinct
from i), and in Cr by Sloat as having e. Assuming, then, that all of this set have an original *e, the correspondences no longer contradict the a-i shift, but are simply a separate sound change.

This is not meant to imply, however, that there are no unexplained exceptions to the sound shifts we will set up. There are, in fact, a number of these. Some of these exceptions are undoubtedly due to borrowing, but the extent of these cannot at present be determined. Some of the exceptions are probably due to analogic, assimilatory, or other changes within one or another language. Additional data from other IS languages may clarify some of the irregularities. For example, Ka also has two front vowels, i e, which correspond regularly to patterns given below: *a > Ka e (Cr i), *i > Ka i (Cr i), *e > Ka i (usually; Cr ε). Since the Ka changes do not quite match those of Cr, a careful comparison of irregular forms with Ka cognates, when these can be found, might be helpful.

Reichard also discusses some of these problems in her Coeur d'Alene, but took up what turn out to be several separate issues, and did not provide a great deal of clarification. Another attempt at explaining these questions occurs in her "Comparison of five Salish languages." This seems to be clearer than her earlier work because she had more comparative data to work with. Many problems remain unsolved, however, and what we find to be separate issues are again combined and confused. Most of her good comparisons in this article are between Cr and Ka; but since Ka not only reflects vowel changes similar to those in Cr, with some special problems of its own, it was not the best language to begin comparisons with. Reicbard's explanations
are valid, however, and often conform to various points discussed below.

3. We hypothesize that PIS had a four-vowel system: *i *u *e *a. This system has fewer vowels than Cr, but we believe that all Cr vowels can be regularly derived from them. Irregular correspondences are relatively few in number, and do not involve vowels that are not elsewhere derivable by regular means.

In addition to hypothesizing these four PIS vowels, we must recognize three types of the *e. These are functionally rather than qualitatively different. The first is an independent, full-grade vowel (although it could ultimately have been derived in the same way as the second, with the full-grade form having been lost, leaving only the e-grade form, which then developed its own, new reduced grade; if this is the case, then PIS would only have three vowels plus one ablaut vowel); instances of this *e are numerous. The second *e is a secondary ablaut grade of the other three vowels, although Cr has modified this pattern by eliminating the *u-e ablaut in favor of u-u (i.e., no ablaut). The third is both structurally and functionally different. In effect, it is epenthetic, breaking up certain consonant clusters (particularly those involving resonants), and is largely predictable. It is quite unstable, appearing in certain characteristic positions in slow speech, but may occur in other positions (or not at all) in allegro speech.

The most characteristic developments of PIS vowels may be summarized as follows. Cm retained all vowels unchanged, except that *e before y or y became i and *e before or between labials and labialized consonants became u. Cr retained *u and *i, except that *i was lowered to e and *u
to ə before r, uvulars, and pharyngeals. *a remained, and *ə became Cr a before these same back consonants. Otherwise *a became Cr i (but still turns up as Cr a if a suffix containing a back consonant occurs on a form) and *ə became Cr e. Epenthetic *ə was unchanged in both languages.

A distinction must be made between stressed and unstressed vowels in these developments. The above changes apply primarily to stressed vowels. Stress in Salish is unstable, however, and can shift from one morpheme to another (although not randomly), moving particularly toward the end of the word. There is a tendency for some occurrences of vowels to change quality when they lose stress; in particular a often becomes ə (which becomes Cr e), and ə is sometimes lost completely (and in Upper Chehalis ə becomes unstressed a when stress is shifted). What appear to be irregular correspondences are often quite regular when stress shifts are taken into account. For example, Cm a may correspond to Cr e if the latter is unstressed. But two explanations of this correspondence seem to be possible: (1) If a PIS form had *a, this vowel could alternate with unstressed *ə. *a could become either Cr a or Cr i, and *ə would become Cr e. If Cm then retained (or recreated the form with a, it would then correspond to Cr e. Because stress is movable, four possible stress-pattern correspondences can occur: Cm a/ Cr a or i, Cm ə/ Cr e, Cm ə/ Cr ə or i, and Cm ə/ Cr e. (And since the de-stressed vowel need not change quality, correspondences with Cm ə and Cr ə or Cr ə can also occur.) (2) PIS *ə became Cr i, both stressed and unstressed, then (pre-)Cr i became e (this possibility would then underlie the fairly common alternation of Cr i with e). Since there are e-ə alternations in Cr as well as i-ə, some explanation of this Cr ə is necessary,
and simple alternation of all PIS vowels with *e, which became Cr e, will not quite work. This stressed Cr e would still come from PIS *e, but Cr e would be retained unchanged. The lack of Cr u-e alternations could be taken as further evidence for this unsymmetrical set of sound shifts.

Details and known instances of vowel developments follow. Minor variants are included and explained here, and correspondences that do not fit regular patterns are given. For each correspondence the Cm form is given first, then the Cr, with known Ka, Sp, Cv, and Ch cognates following in parentheses. The Cm and Cr forms are separated by a diagonal bar; the meaning follows the Cr form if the same for both stems, but if the meanings are different each is given following the appropriate form (and the bar follows the Cm meaning). Ordinarily only the root is given. If this cannot be isolated with certainty, however, the whole stem or word, or as much as can be isolated with certainty, is given. Note that ? between the vowel and a following consonant does not affect the development of the vowel.

PIS *a

A. Becomes Cm a, Cr a

1. before r, uvulars, and pharyngeals (hereafter referred to as back consonants)(whether immediately following or not):

   spápq-+ca? weasel/s-pápq-+ce? ermine (Ka pápq+ce? weasel); ?ásqʷsaʔ/
   ?ásqʷ son (Ka sqʷseʔ, Sp, Cv sqʷsʔ?); ?áyaχʷt/?áyaχʷ(t) tired (Ka
   ?aíχʷt get tired); sxaxʷísxʔa?/wesxəx robin; kʷár-/kʷár yellow (Ka
   kʷaːlʔ?, Cv kʷrʔ?); w̱ark/wärʔ frog (Cv swarəkʷxən); caʔs/cálus king-
   fisher (Cv caʔs, Fl caʔs) [the l in the Cr form shows that it is
borrowed from Ka, which has changed r to l; the vowel correspondence holds, however; werwark-á+p tall sunflower/s-gárdéem flower; ́taʔtáq shocks of hay/́táq bushy stuff lies (Ka ́táq lay down something); ̰áq̰/̰áq pay, reward (Ka ̰áq); náʔq/náʔq rot, rotten (Ka náʔq); páxʔ wise, smart/páx be wise, think, reflect (Ka páx think, deliberate); páx- scratch, scrape/páx rub on rough surface; waʔt-ált child, baby/gáx̂(t) be young; ́áx̂/́áx(t) friend, partner (Ka ́áx̂, Cv s-́áx̂t); wáxp itch/ wáʔx smart; sáʔxʷ melt/sáʔx dissolves; ?asx̂áʔx̂ʔ/nasx̂áʔx father-in-law (Me ŝx̂áʔxʔ̂); scáʔqʷ summer, July/s-cáʔqʷ fall, autumn (Me scáʔqʷ summer); táx̂qʷ get away/táx̂q foot slips (Ka táx̂qʷ slip); caʔ-/cár scream (Ka caá holler, Cv cáʔ-); yaʔ gather, round up/yár assemble, be many, gather, crowd (Ka iyáʔ-, yáʔ-); xaʔ- fan, blow/xár fan (Ka xá cool ?); in suffixes -áqʷ/-áqʷ tree, long object; -áqʷp/-áqʷ throat; -á+p/-á+p tree, plant (the Cr form is found only preceding -áqʷ, otherwise -á+p occurs); -aʔqíxʷ smell/-áqíxʷ breath; -aʔqíyt/-aʔqíwt shoulder; -ápqen/-ápqen back of head; -ásqt/-ásqt day; -áqs/-áqs clothes; -áxən/-áxən arm.

2. for indeterminate reasons:

a. xʷám/-xʷám (Cr form uncertain) roan colored (Ka xʷém paint red ?); qʷám- good, feel good/qʷám (Cr form uncertain) be pleasant, comfortable, pleasing, fascinating; ́scám/s-cám bone (Ka, Sp scóm, Cv scím); ́c.awt/c.awt wash (Ka cέʔu). ́xáxat/xʷát-xʷat duck (the first vowel conforms to pattern 1 above, but the second is irregular) (Cv xʷátxʷat, Ch x̂átxt); mácp/mácp bee; páʔs/páʔs come to surface; ́jáʔ, ́jáʔ, ́jáʔ, ́jáʔ housefly/hamáʔtemş fly, insect.
maggot (Ka, Sp, Cv χαμάτανι fly); má?i water gets warm/má?i come to boil (Ka má? bubble); káy/čáy hard, stiff, strong; swá?/s-wá? cougar (Cv swá?, Ch swá-wa?).

b. borrowings. ʔáns/ʔánš angel; cáynamän/cánmän Chinaman; lawáns/aatsa; laptáq/patáq potato (Me lapták); n-tél-ánəʔ/ʔen-téláneʔ wolf (Ka nteláneʔ) [only the Cr form is borrowed, probably from Ka].

B. Becomes Cm ø, Cr á when unstressed in Cm and stressed in Cr:

mátus/mátus kidney (Ch máťs kidney, máť-s his kidney); máčút/ máć-út put (Me mčá+t); sxʷeláken/sxʷal-ísčən big buck.

C. Becomes Cm a, Cr e

1. when stressed and following *ɛ:

háč/-Réc tie (Ka aáč, Cv ʕác); háy/-Reṭy angry (Ka ʕáymti he's mad, Cv ʕáymt angry). (But cf. háʔi/Rid hot; sháʔantk/s-Ríhent Canada goose.)

2. when stressed in Cm but unstressed in Cr (these are not exactly cognate vowels; *a when unstressed would have become *e in PIS, and this vowel developed regularly to Cr e--see page 7 above):

s-k-tám-qən/s-tem-ílgwes relative; swát/ségwet who (Ka suwéť, Ch wáʔ); kaʔ+ás/číʔ+əs three (Ka, Sp čeʔ+č(s), Cv kəʔ+šə, Ch čáʔ+e); xəmán/ʃəmën enemy (Ka, Sp ʃəmən, Cv xəmən); ság/-ʔesəl two (Ka, Sp ʔesəl, Cx ʔasəl, Ch sáʔə); sxʷal/ʔən-šégwεl road, trail (Ka šuʔsuwéť, Ch šwət); čq-áʔp/cáq-čʔp fir; məʔkəýaʔ/mítčədeʔ blood (Me məkíyaʔ); χələxʷ/χələxʷ tooth (Ka, Sp χələxʷ); in suffixes -əłəwás chest/-ílgwεs heart, stomach.

3. when unstressed before final ? (usually the suffix -aʔ/-eʔ):
ccama-/cicém-ec small (pl.) (Ka +ccímet); k'úška- haunt/k'úsče? ghost, haunt (Ka k'úsče? ghost); ?úcqa?/?ácqe? go out (Ka, Sp ?ácqe?, Cv ?ácqa?); k'ícíwa?/cí'w-ec? left (hand); kkítə?/ći-t-ec? near (Ka cí-t-ə?); ?ítłxwa? black camas/?étłx-ec? camas (Ka, Sp ?ítłx-e? cooked camas, Cv ?ítłxwa? camas); spápq-tča? weasel/s-pápq-čec? ermine (Ka pápqčec? weasel); páca?/pčec? root-digger; púly/a/plye? gopher; pák'olala?/pek'le? ball; tówən-tča?/títωn-tčec? doe (Ch tácwn+ce); tíkwa?/tík'we? father's sister; stía?/s-tčε? hay, tall grass; k'ýa?/ťecdε? canoe (Ka, Sp k'iyə?, Cv k'iyə?); támka?/s-t-tímac'ce? daughter (Ka stómčεʔélt, Sp, Cv stámke?élt); tóna?/tíne? ear (Ka, Sp tóne?, Cv tínə?); tátúpa? great-grandchild, great-grandparent/túpye? great-grandfather (Me. túpa? great-grandparent); stúlca?/s-tún+ce? mule deer (Cv stólca?sqáxə? mule); n-tel-ána?/?en-teláncε? wolf (Ka nteláncε? glutton); sfnc?/sin?cε? man's younger brother (Ka, Sp sínce?, Cv sínce?); cáya?/cicíye? woman's younger sister; x'iyápa?/?e-cux'w-cux'w-øyípe? rose hips; cósolúša?/s-s-c-ös-lúse? hail (Ka ssa-lúse?); kk'yáʔ/čiče? mother's mother, woman's daughter's child (Ka čičiye? mother's mother, Ch káy grandmother); yúk'wε? woman's older brother/yúk'we? woman's younger brother; qqána? father's mother, woman's son's child/qíncε? father's mother (Ka qóne? father's mother, Cv qaqána? son's child); qápəx'wa? nut/qípx'we? walnut (Ch kápox'w hazelnut); s'xápa? father's father, man's son's child/xpɛ? father's father, son's child (Ka sxépe? uncle); sq'wesq'ása? baby/s-q'wás-q'wεcε? child; q'wεc'wąyaʔ/q'wq'wεc'wɛyeʔ chipmunk (Ka qwq'cwucwé); in suffixes -ána?/-íne? ear; -ápala/?-ípɛ? handle; -ča? blanket, skin, hide/-tčε? all around, all over; -á+ca/?
-i?cc? body.

4. in most borrowings:
qayú's/qeyle'us Cayuse; sáma? Spaniard, Frenchman/héme? Frenchman; ?ápels/?épis apples (Me ?ápis); suyápemux/suyépemé white man (Ka suyápi); súlcs/sóltes soldier; laputáy/lebuté(m) bottle (Ka lepu-te, Me laputáy).

5. for indeterminate reasons:
a. (some or all of these probably reflect different ablaut grades)
?awt- accompany, oppose, behind, back part/?éw(t) oppose (Ka ?eut-oppose, Ch ?aw- behind); ?ám(t)-/?ém(t) feed (Ka ?ém(t)-, Ch ?óm give food); ?ám- wait/?émut one sits (Ka ?ém(ú)t- sit, Me ?émítx sit (sg.), Ch ?ámq wait); taw-/tégw buy (Ka têu buy, sell, Me tów); yáixw- cover/yèixw cover with material; wáix-/g erw tilt, slope; qáixw hang down/qèixw hook over or into (Ka qalxw hang up high on hook); myát/muyèt too, very; qáxp get on top of/qètp go up incline; máy-tell/méy report (Ka méi show, teach, tell); ták wag scratch/tekw pierce with fine-pointed object, fork, barb, spike.

b. unstressed in Cm but stressed in Cr (the Cm a in these forms may be from an underlying é, which would then correspond to Cr é). pam-/bém buzz, rumble; qaw- split/qèw break stiff object (Ka qa?u break); xap-/xép pile flat objects; pa?án/chel tree bark (Ka ci?élxw, Ch pa?in?); waxwìlia? icicle/gèxl plural objects hang.

c. when unstressed in both languages. wawa?kìwe(w)g-fét poor-will; qa?kìwìlx/te?kìfì? shaman (Me ka?kìfìx); (s)ka?álp parent of deceased spouse/s-?élup last living relative; in suffixes -a+níwt/
-enf' along side.

d. m̱̱kayen/mélt? bait; s-k+áʔi/s-č+čmt dew, light fog.

D. Becomes Cm ø, Cr ʔ when unstressed in Cm and stressed in Cr (these could equally well be derived from PIS *i)

kam- grab a handful/čim grab some; m̱̱ḵ́ḵ́yaʔ/míčedʔ blood (Cv m̱̱ḵ́iʔmʔ?);
in suffixes -o̱w̱ás chest/-ílgwʔes heart, stomach.

E. Becomes Cm a, Cr i

1. regularly in all other instances than the above:

sápan/sípan daughter-in-law (Me sípan); xwiýapaʔ/-čučŭ-cučw-wojípeʔ rose hips; sx̱aʔapaʔ father's father, man's son’s child/čípeʔ father's father, son's child (Ka sx̱ápeʔ uncle); +káʔ bucket, kettle/čiʔp bucket (Ka +čéʔ kettle); ?áʔp/-ʔíp (also ?áʔp before back consonants) wipe (Ka ?áʔp wipe off, Ch ?áʔp- rub, pet); sláʔ wood, stick/íʔp wood (Ka lúkʷ wood ?, Cv sláʔ wood); qáʔexʷəʔ nut/qípwxʷeʔ walnut (Ch kapóxʷ hazelnut); m̱̱ry̱ám medicine/marím treat for illness (Ka m̱̱ṟ̱iye medi-
cine, Fl malye medicine, Cv marímstam medicine); yilám- run (pl.)/
dulím gallop, go on fours; lám̱̱t glad, happy/lím(t) be glad, thankful,
pleased (Ka lám̱̱t glad, grateful); tám̱̱ḵ́aʔ/s-t-tím-ččeʔ daughter (Ka sṯ̱m̱̱č̱̱eʔél, Sp, Cv sṯ̱m̱̱koʔél); stám/s-tím what (Ch tám); smiyáw/
sṯ̱m̱̱y̱íw coyote; taw̱̱wén-tčeʔ/tíwun-tčeʔ doe (Ch taw̱̱wén+če); paw̱̱/fíw light in weight (Ka ḡ̱̱ppé, Sp ppéʔu, Cv pepíw'); psáws ground squirrel/
síws groundhog, prairie dog; wáwp- back up/gípw'ep step back; ḡ̱̱w̱t-
go with/?ígw set out for (Ka ḡ̱̱ut follow, go behind); sáw- ask/ígw ask for (Ka séw ask for information, Ch sáw- ask); ḵ́kw̱̱aṯ́enaʔ/kʷíṯ̱en mouse (Ka ḵ́kw̱̱aṯ́enʔ?, Ch kʷí̱̱átanʔ?); sáʔstam woman’s brother-in-law,
man's sister-in-law/sistam man's brother's wife, man's wife's sister
(Me sâ?stam sister-in-law); qâ?c/qâ?c warm (Ka qâ?c); pâca?/pâce?
root-digger; qâck/qâck man's older brother (Ka, Sp qâ?c, Cv qâck);
'tâc- iron, press, smooth/tâc smooth by rubbing; qâ?ct/qâ?ct(t) full
(Ka qâ?c, Me qâ?c-); wânx war-dance/wâ?x dance war-dance (Ka wâ?x
dance war-dance); kwân-/kwâ?n take, carry (sg. obj.) (Ka kwâ?n- take
(sg), Cv kwâ?n- take, Ch kwâ?ná- hold, take); xâmk like, love, want/
xemânâ like, love (Ka, Sp xamânâ love, Cv xamânâ like); tâna?/tîne?
ear (Ka, Sp têne?, Cv tîne?); qâqâna? father's mother, woman's son's
child/qâne? father's mother (Ka qâne? father's mother, Cv qâqâna?
son's child); kwân-/kwâ?n try, test, examine (Ka kwâ?n); smânxw/mîlxw
smoke tobacco (Ka, Sp ménxw, Cv sâménxw, Me smânxw); kt-mâluxw/mîlxw
naked (Ch mâlâxw); (s)ka?â?l parent of deceased spouse/s-ce?â?lup last
living relative; sqâltk/qâltc meat (Ka sqâltc body, flesh); qâlâm
tamanous song/qâlîm song; qâ?ispâl/-qâlîspâl Kalispel (Ka qâlîspâl);
mât-/mât rest (Ka mât); kâât-/cîlt give (Ch câât-); câât- frighten/xît
fear (Ka câât fear, be afraid); spâkâm/s-pîtem bitterroot (Ka spâkâm);
sâkuxan/s-xît-umşen leggings, trousers; tâym- easy/ûf-d-em frail,
fragile; qâ?y- black/qâ?d make black, blacken (Ka qâ?i, Me qâ?y black);
qâ?y? trade/ûf exchange, barter (Ch qâ?y?- trade); hâ?e hot/ûf
plow, become red hot; qâ?y rich/qâ?y have plenty (Ka qâ?i have plenty);
nâk- chase, scare, train/nîc drive one animal with goad; llâk thin/
i:ič be thin slice (Ka t'laq thin, Sp t'leč thin, Cr t'lič thin);
spáksman/s-píčs-man pestle; cák woman's mother-in-law/nc+cč man's
mother-in-law (Me tččcik mother-in-law); snák+xʷ/s-nčč-txʷ son-in-law
(Ka sčččč+xʷ, Me snččč+xʷ); wáx- live, dwell/wfx build, dwell; scáxt/
s-cčšt man's brother-in-law (Ka sččšt, Me scčxt); smákʷt/smíkʷt snow
(Ka, Sp sémáqʷt, Cr smíčʷt); yákw/-dtkʷ cross; xʷákw(t)/xʷfkt(t)
frost(y); ?ákwən/?tkʷul fish eggs; póxʷ/píxʷ bright, shiny (Ka póxʷ);
wenáxʷ/guníxʷ true, right; tá?- mash/tí? pound, hit (Ka te? pound);
kʷá?/-kʷí? bite (Ka, Sp kWó?, Cr kwə?-); ká?- stick in, push in/qí?
stick to, wedge into (Ka qe? put, stick); tá?- edge/tí? be close to
dge, border (Ka te?- arrive in a narrow place); wáh-/wǐn dog barks
(Ka uh); šáhəntk/s-rǐhent Canada goose; in suffixes -áks(en)/-ččs
hand, arm; -ákt/-íčt hand, finger; -álps/-čps back of neck; -ált/
-ílt child; -áča?/-táčč body; -a+qáy/t/-a+čqʷt shoulder; -átxʷ/-ítxʷ
house; -ána?/-íne? ear; -ánk/-ínc belly, flat surface; -áp/-íp door
(or -ép in Cr before back consonants); -askáy/t and -áskít/-ískčyt
pharynx; -átkʷp/-tkʷap fire; -áws flat surface, upon, across/-ččs
between, together; -áwt/-íqʷt neglected, far; -átkʷ/-ítkʷe? water;
-álus/-ígčwes property; -álxʷ/-íxʷ skin, hide; -nwáleň/-ingwíľan
something; -xán/-šén foot, leg (or -šén in Cr before back consonants);
-áp foot, lower end/-íp bottom, after, behind; -ápəla?/-ípčč handle;
-á?st/-íst rock; -á+p/-í+p tree, plant (unstressed Cr has -ččp)(these
last four also occur with a in Cr before back consonants: -ápqən,
-áplaʔqən, -áʔstqən, -a+ąlqʷ).
kxap-/čišíp chase; kamámaʔ?/ʔe-čímul pine needles; sqaltámixʷ man/
sqaltámixʷ man, husband (Ka, Sp, Cv sqaltámixʷ man, husband); kaʔtás/
čiʔ+es three (Ka, Sp čeʔ+é(s), Cv kæʔtšis, Ch čáʔ+če); qʷaʔ/-qʷʔ? hollow
(Ka qʷéʔ? a draw ?).

3. uncertain correspondences:
sxʷetalakən/sxʷal-ísčən big buck.

F. Irregular, unexplained correspondences

1. Cm a, Cr e
laputáy/lebuté(m) bottle (Ka lepu·te, Me laputáy); sqʷáqʷaʔqʷaʔ/-qʷʔqlqʷ-
alqʷ prairie chicken (Cv sqʷáqʷaʔqʷaʔ?); máʔw- break, smash/máʔw smash,
ruin (Ka máʔu burst, break off, Cv máʔw- break); qʷáfʷ drunk/qʷéʔʷ
be insane, drunk, foolish, irresponsible (Ka qʷéʔ(u) crazy, drunk,
Cv qʷáfʷ- drunk).

2. Cm a, Cr i
kát/-čít (Cr form uncertain) brown.

3. Cm a, Cr u
sxʷaʔník/sxʷúʔn-eč thornberry; xʷáʔ- run away, escape/xʷúʔ go (Ka
xʷúʔ go, Cv xʷúʔ- come, Ch xʷúʔ- gone, lost).

4. Cm a, Cr c
'tésxʷaʔ?/těšsóʔ sneeze (Ka təsóʔ, Me tísxʷaʔ?).

5. Cm a, Cr e
cáncan/cáncan grasshopper; in suffixes -ámχ/-əmχ people.

PIS *i

A. Becomes Cm i, Cr e
before back consonants. píq/-péq white (Ka, Sp, Cv píq); st'ífqxon/ s-stéréq-şen mudhen (Ka steláqssən, Cv stéréqxon); líq/-léq bury (Ka lág); 'líq'-/télq' explode, go off; cíq'- copper-colored/céq' bright pink; cíq'- skin an animal/céq' butcher; ptíxw/-tə-póx' spit (Ka, Sp pitáxw, Cv spetíxwum); cífw/-céx' spark; kífw/-céqw pray (Ka cáu, Me káw-); ságwśaxə'/wésaxə robin; ?ítxʷə? black camas/?étxʷə? camas (Ka, Sp ?ítxʷə? cooked camas, Cv ?ítxʷə? camas).

B. Becomes Cm i, Cr i

1. when unstressed and not in the syllable preceding the stressed syllable and separated from the latter by only one intervening consonant (cf. Sloat 1968):
   p'áxʷiʔ/páxʷ-ʔt cough, choke; qelispát/-qelispátem Kalispel (Ka qalispá); yilämíxʷəm/yilämíxʷəm chief (Ka, Sp, Cv yilämíxʷ(um)).

2. for indeterminate reasons (except for the first of these, the i in the Cr forms alternates freely with e):
   pík' bright, shiny, sparkle/píć (Cr form uncertain) shine, glitter;
   wíʔ/-wíʔ act unnatural, silly; yilám- run (pl.)/dlíʔm gallop, go on fours; miya+/miyə+ too, very; smiyáw/s-miyíw coyote; stíʔfcxon/s-tiyč'-šən killdeer.

C. Becomes Cm i, Cr i

regularly in all other instances than the above. sípíʔ/síp'-čy hide, buckskin (Ka sípíʔ wear moccasins); cíp'-cép pinch (Ka cíp-); kíp/- číp pinch, clamp; típ/-típ stripe (Ka tíʔ- draw a line); wəlwlím/ wəlwlím iron, metal (Ka, Sp u·lu·lím money, iron); xíw/xíw raw, uncooked (Cv xíw); tkíw/-tčíqwúl climb; kkítaʔ/čít-ε? near (Ka
close; corrugated, marked; youth, young boy (Ka +tətwít boy, Sp, Cv +tətwít boy); oldest first, oldest; ups flea; pícxʷ t disgust, bore/pícxʷ(t) become angry; Coeur d'Alene; snowshoe hare/s-q'íc-amʔ cottontail (Ka, Sp s-q'íc-ciʔ cottontail); blanket (Ka, Sp, Cv s'cem); pitch, rubber/tít gum; turn blue (Ka, Sp, Cv q'ín green); old woman/s-pətwínuxʷ head of a nest, brood or household; tínx/tínš sinew (Ka tínš, Me tínx); man's younger brother (Ka, Sp síncaʔ, Cv síncaʔ); sk'ínt Indian, person/s-čínt person; horned toad/s-memíŋep toad; rub; scared, dangerous/ čínt dangerous (Ka čínt afraid for); s-t-k-kínt-ús/s-t-č-číntus pupil of eye; cílkst/cíl five (Ka, Sp cíl, Cv cílkst, Ch célačs); cheat (Ka q'íl); sprinkle; shaman (Me ka?kwíl ix/te?kwíl š; eat (Ka, Sp, Cv ?tèn, Ch ?ět); take apart, take off; take off clothes; make clear, know (Ka mi know, find out); pinch, squeeze/pl'y squeeze (Ka peʔ press, squeeze); rough/prickly; see (Ka, Sp wíčem, Cv wík-); cut with blade (Ka nič cut, saw, Me nič cut); miss a target; wawaʔíkʷ/weʔ(ə)-y fíč poor-will; kíkʷaʔ/číkʷ-éʔ left (side); father's sister; scatter, pour dry substance/píxʷ pour solid objects or liquid (Ka píxʷ pour, spill liquid); cíxʷ/cíxʷ cíxʷ fishhawk (Ch číxʷ); chief (Ka, Sp, Cv ilémičʷ(um)); sucker/
qíxwa? fish; qí?xw/qu?xw stink, odor (Ch qéw-); miy-/mi?t middle;
ki-/kíh approach, get near (Ch ké- bring); stí?íxen/í-túí-á-šen
killdeer; skín/s-čím pika; susukř/žískř Jesus Christ; in suffixes
-a+níw/-e+níw alongside; -a+qíxw smell/-a+qíxw breath; -íken/-íčn
back; -íca? blanket, skin, hide/-íce? all around, all over; -cín/-cín
mouth; -qín/-qín head; -wíl/-qúíl canoe, conveyance.

D. Irregular, unexplained correspondences

1. Cm i, Cr a
míxa? black bear/s-máx?íčan grizzly bear (possibly borrowed from Ka,
Sp sæmgæ?íčan grizzly bear; Cv sæmgæ?íkan); kqíw-break eggs/táq'-s
egg or eye bursts (possibly not cognate); lúpi? birch-bark basket/
lupay basket (in the Cm form the -í corresponds to the Cr -ý, and
the vowel has been lost).

2. Cm i, Cr e
sxwə?ník/s-xwú?n-eč thornberry (the stress difference probably accounts
for this pair, the unstressed vowel in Cr becoming e via PIS *e or
pre-Cr *i); 'ps'/pétse? nighthawk (Me 'pás).

3. Cm i, Cr u
kwamkwímcxan/s-kwaum-kwaum-íwutšan rainbow (Cv skwamkwémmsan); qí?-
hook/qúít woven, knitted (possibly not cognate; Ch qúít fishhook);
ckwík'/cékukw elderberry (Me ckwék'w); cíxwíxw/cíxwuxw fishhawk
(Ch cíxw'); cæxelícan marten/caxyu?can mink (Cv cæxelícan? marten)
(the Cr form looks borrowed); 'carís/céluš kingfisher (Cr is borrowed;
Cv cérés). The presence of labialized consonants and unstressed
vowels in several of these, and the fact that some are loan words
probably will explain these irregularities; perhaps unstressed *ə before or after a labialized consonant became Cr u.

4. Cm i, Cr ə
nís-/s-nós snot (Ka nós snotty).

5. Cm i, Cr ə
xʷiyápaʔ/ʔe-cuxʷ-cuxʷ-wəy̕ípəʔ rosehips (possibly an epenthetic ə in Cr).

PIS *u

A. Becomes Cm u, Cr ə before back consonants
qʷúm-qən/qʷóm-qən head (Ka, Sp qʷómən hair on head, Cv qʷəmqən antlers); sxʷelúʔqs cottontail/s-xʷel-ștqu̲n jackrabbit (Ka sxʷelóʔqs prairie rabbit, Me sxʷelúʔqs cottontail); púlpuqən/pól-pəqən thimbleberry; núxʷnuxʷ wife/nóxən̓x̑ spous (Ka nəxʷən̓xʷ wife).

B. Becomes Cm u, Cr u regularly in all other instances than the above
lətkuʔ/lətkuʔ otter (Ka, Sp, Cv ltkuʔ); kʷxʷúp/kuxʷúp win, earn (Ka k̕xʷúp best in game); xʷúpt stupid, weak/xʷúp inefficient, careless (Ka, Sp, Cv k̕xʷúpt lazy); lúp- dry/lúp dry, thirsty; məlqənus/məlqənus golden eagle (Ka, Sp, Cv məlqənus); tǔpləʔ/tūpən spider (Ka tūpəł, Ch tūpəʔ); tətúpə? great-grandparent, great-grandchild/tųpyəʔ great-grandfather (Me tǔpəʔ great-grandparent); lúpiʔ birch-bark basket/lupəʔ basket; púm brown, buckskin color/púm mouse-colored (Ka púm brown); tǔm- suck through pipe/tūm smirk, mouth in sucking position (Ka təm- suck); syúmcan rival/sdúmcan relative-friend; súm-/súm smell at, sniff (Ka súʔum smell); stqǔsúmən/s-t-ʔwəsúm weasel (brown) (Me
stq'súmøn); kúw be gone/ů w be absent, gone, missing, empty (Ka ēu absent, away); xačønut/káčønut nine (Ka, Sp, Cv xačønut); lút not/lút mischievous, not, negative; pkwút/pékwút skin, hide; x'út/x'etút rock (Cv x'út); yačwúlxútxøn/yax-yax-útxøn badger; sú't/sú't stretch; núw-?úw-íš dive (Ka, Sp, Cv ?úst, Ch ?éso?); pu?pu?s-ánk mourn/pa-pús-inč sad, sorry, mournful; mú- feel/mú- fumble, feel about; múse/múse four (Ka, Sp, Me mú, Ch mú); cús-/cús rattle (Ka cós); kwúst/kwúst frisky, skittish, shy; kwúst- shrivelled/kwúst curly (Ka kwúst- curly); kwústka- haunt/kwústce? haunt, ghost (Ka kwústce? ghost); ña?úse?/ñúse? egg (Ka, Sp ñúse?, Cv ñe?úse?); pús/pús cat (Ka, Sp, Cv pús); matús/mátus kidney (Ch més kidney, matós-s his kidney); súsem/tús marrow; cáxalúsa?/s-ës-cés-lúse? hail (Ka ssa'lúse?); s-t-k'int-us/s-t-c-cintus pupil of eye; syaxwúsmís north wind, blizzard/ yuwxwúsmís Cold; qayú's/qeyes Cayuse; sxwúsam/s-xwúsam foamberry (Me sxwúsam); s-na-tús-møn/s-č-útus-møn eye; scpú's heart/?ic-pú's desire, heart (Ka, Sp, Cv spuú's heart, mind); qwúct/qúc fat (Ka qúc(t)); smúxøn mare/s-m-múcšen female animal, mare; tu?ün- that way/tu?un be in opposite direction; túnx man's sister's child/túnx man's sister's child, man's brother's child; múl-/múl dip up (Ka múl go and fetch water, Me múl- dip); súl(t)/súl(t) cold (Ka súl); kwú+ borrow, lend/kwú+ lend (Ka kwú+ borrow, lend); xwúl-/xwúl drill a hole (Cv xwúl-); stúca?/s-túncce? mule deer (Cv stča?sqáxa? mule); pu?ya/puíce? gopher; mecù+t/mé+cùt pus (Me mecá+t); scú+tam bull, bull elk/cu+um buffalo (Ka, Sp, Cv scú+tam bull); sqwú?+ dust/qwú?+ get dusty and qwú?+ be dusty (Ka, Sp, Cv sqwú?+ dust); suýapənuxw/suyépøm white
man (Ka suyápi, Me suyápixw); puy-/?úkW wrinkled (Ka púi); ?úkW- haul, take, bring/?úkW carry, bring (Ka ?úkW take, bring, Ch ?ékW- go after); yúkWa? woman's elder brother/yúkW? woman's younger brother; yu?yu?kWUl/ dú?kW stingy (Ka yeyúqwe?); súkW(t)- drift, float/súkW-t float with current (Cv súkít drift); púxW/-púxW blow with mouth (Me púxW-, Ch pòxW-); súxW- know, recognize/súxW be acquainted with, know (Ka súxW know, recognize); súxW-elex fish jumps/súxW-UL fish dives scú?xen/ s-cú?-šen foot, leg (Ka, Sp scušín, Cv scošán); qWyu Oregon grape/ s-qWéy-u? grape; cuw-/cú? hit with fist, punch (Ka cu?-); skwukW-kAlt/ s-kWu-kWút-t'it fawn; laputáy/lebuté(m) bottle (Ka lepu-té, Me laputáy); in suffixes -úlxw/-úlaxmW earth, ground; -úps tail, rump/-úps anus, anal region; -ús/-ús eye, face, fire; -lúp/-lúp foundation, floor.

C. Irregular, unexplained correspondences

1. Om u, Cr a


2. Om u, Cr i

susu:kř/jisó:kř Jesus Christ.

3. Om u, Cr o

scúmcum s-cóm-cóm-t a boil; mú?t/mó?t smoke (Ka moot, Ka, Sp sómiót); pú:s thought/pós concentrate; spúct pimple, sore/s-púct scab, sore, excrement; húy visit, go next door/húy cease (Ka hói quit doing, Me húy go); súlca:s/sótes soldiers; susukř/jisó:kř Jesus Christ; lákWu:só/ lqúkóso pig (Ka lóko:só pork, Me lákWósó pig, Ch kùišú pig).

4. Om o, Cr o
mmó·c/noc soft, tender (Ka +emmóc, Sp húc, Cv mmáč).

5. Om u, Cr ə
puʔpuʔ-s-ánk mourn/pa-púš-inč sad, sorry, mournful.

PIS *ə
A. Becomes Om ₁, Cr ε before y, y, d, or ʃ
qʷiy/qʷéd black; kiyʔ/tédeʔ canoe (Ka, Sp kiyʔ, Cv kifʔ); qys-balky, stubborn/qédem refuse, balky: stiʔaʔ hay, tall grass/s-tédeʔ hay, grass, fodder (Cv sleyʔúxʷ grass); lifyʔ/léʃ stab, poke, sting; lifyʔ scribble/téʔy make dirty marks, scribble; mfiʔp learn, find out/méy-p come to know; qfiʔu Oregon grape/s-qvéʔ-u? grape; xʷxʷiyʔ/xʷuxʷeʔ? narrow (Me xʷoxʷáyat); sʔəʔlʔ/sʔəʔ-éʔ hide, buckskin (Ka sʔəʔlʔ wear moccasins, Me sʔəʔlʔ skin, hide); wiʔ-/qvéʔ finish; qiyʔ/qeyʔ spotted, make marks, write (Ka qeʔI write); kkiʔaʔ/čičeʔeʔ mother's mother, woman's daughter's child (Ka čičiʔéʔ mother's mother, Ch kíy grandmother).

B. Becomes Om ə, Cr a
1. before back consonants:
čάʔp extend, patch, splice/čáp adhere, stick to; sqʷasqʷásəʔ baby/s-qʷás-qʷesəʔ child; tásəʔ tired, bored/tásq weary with waiting; tǎʔčxʔ/tǎʔčxʔ look at, watch (Ka tǎʔčax look); məyám medicine/mərim treat for illness (Ka ma-liyé, Cv mərəmʃən medicine); təʔ- unravel/təʔ untie, loosen (Ka təl untie, unwrap); kər/-čər cut with scissors; kər/-čər swim (Ka ʔaal-, Sp ʔaəríp, Cv ʔərám); yərkʷ bend/yərkʷ curved, crooked; xʷəɾp/xʷər shake, tremble (Ka xʷə-líp, Cv xʷəɾáp); stəɾfəxən/
s-tārq-šen mudhen \( \text{Kh tēlāqsšen, Cv stērqxan} \); tārq kick, dance/tārq touch with foot, step on, kick \( \text{Cr form probably borrowed from Kh; Ka tēlq kick, dance, Cv tērq- kick} \); tērq- a row/tārq laid out in trails, have trails; cālχ- scratch/cālχ claw, dig claws in; s-qwāɭqwaɭqwaɭ prairie chicken \( \text{Cv sqwāɭqwaɭqwaʔ} \); māq something going down/māq heavy convex object collapses; tāq/tāq touch \( \text{Kh tq-} \); stāq/tāq- birds return from migration; cāq- set down, set upright/cāq solid object stands upright \( \text{Ch cāq- put down} \); sāq- split/sāq gape, split in two \( \text{Kh sāq- split} \); yāq/-yāq file, sharpen, whet; tāq/-tāq wide \( \text{Kh tāq, Me, Ch tēq-} \); tāqw/-tāqw slap \( \text{Kh tqw-} \); pēqw- spill dry substance/pāqw powder \( \text{Kh pqw- scatter} \); kēχ/-kāχ fast, swift \( \text{Kh, Sp, Cv kāχ(t)} \); yāχ/-dāχ herd, chase; yāχ/-yāχ mark by scratching; xōxanūt/xāxnut nine \( \text{Kh, Sp, Cv x̱anút} \); yaxwixwútxan/ yax-yaχ-útšen badger; cēxwíʔcan marten/căxyúʔcen mink; pēxwíʔ choke, cough up/pāxw-ʔt cough; cāxw/-cāxw promise; lāxw- pile rocks/lāxw plural round objects lie; tāxw/p/ tāxw get away, escape; tāxw- leave rapidly/tāxw- leaverush; cēxw/cārw fringe \( \text{Kh co-\-, Cv cēw-} \); sāxw p drip, leak/sāxw-p leak; in suffixes -alqs nose, point/-alqs end, road.

2. for indeterminate reasons:

tēp- thunder/tāp shoot; xēp- chew on, eat/xāp tear meat from bone; tēmp- tām scorch, burn; tēcp a drop/tāc one drop falls; spēc soft excrement/pāc squirt, defecate; sān/sān tame, gentle, quiet \( \text{Kh sān-} \); māl- warm \( \text{cf. māl(m)} \) uncomfortable warm.

C. Becomes Cm u, Cr a before or between labial or labialized consonants and before back consonants. Note that counterexamples to this and
the following set exist, raising a question as to the validity of this statement.

\[ \text{cúwq- pull a nail out (sg.)} / \text{cawq pull out solid object} \quad (\text{Ka có?óq come off, break off}); \]
\[ \text{smámú}^\text{w} \text{m pile hay/má}^\text{w} \text{ plural objects lie, pile}; \]
\[ \text{mú}^\text{w} \text{ snow/má}^\text{w} \text{ cover with snow} \quad (\text{Ka mxúp snow}). \]

D. Becomes Cm u, Cr e before or between labial or labialized consonants

\[ \text{kúpt} / \text{kwépt spine, backbone}; \text{túm- rotten/tém}^\text{w} \text{ tree is rotten}; \]
\[ \text{púw- drum on/péw drum on tin} \quad (\text{cf. also Cr páw drum on drum}; \text{Ka pu}^\text{m beat drum}); \]
\[ \text{xúk}^\text{w}- \text{ clean, wipe/xék}^\text{w clean, sweep} \quad (\text{Ka xúk}^\text{w clean}); \]
\[ \text{mú}^\text{w}^\text{t}/\text{mex}^\text{w}^\text{t laugh}. \]

E. Becomes Cm a, Cr a irregularly

\[ \text{páyq/páq white} \quad (\text{the Cr form is regular from *e, but ablaut patterns indicate that Cm has inexplicably reformed this root}; \text{cf. píq-/páq white}). \]

F. Becomes Cm ø, Cr e regularly in all other instances than the above

\[ \text{xép}^\text{w}- / \text{xép unfold, spread, flatten out blanket} \quad (\text{Ka xép spread}); \]
\[ \text{xe} / \text{ch button, fasten together, sew}; \text{yém- old/dém very old}; \text{yám-}/\]
\[ \text{yém pin}; \text{kém- / kém a surface} \quad (\text{Ka kém-}); \text{yém not breathing/yém silent}; \]
\[ \text{hemp dissolve, worn out/reém(t) melt, dissolve, waste away} \quad (\text{Ka aamt melt away, Cv yamép dissolve}); \]
\[ \text{tém- cut/tém cut with scissors}; \]
\[ \text{spákem/s-pitém bitterroot} \quad (\text{Ka spákem}); \text{xámán/xémen enemy} \quad (\text{Ka, Sp xamén, Cv xamín}); \]
\[ \text{tyáempt easy, weak, fragile/tfd-em frail, fragile}; \]
\[ \text{qualém tamanous song/qúleém song}; \text{wép- hair/gúp hairy, grassy}; \text{ccúma-}/\]
\[ \text{cícéem small (pl.)} \quad (\text{Ka tícímeet}); \text{kém- / kém carry, take (pl. objects)}; \]
\[ \text{kém/ kém dark, darkness}; \text{xawál/hen-segéwéel road, trail} \quad (\text{Ka šušuwéet},} \]
Ch šāw+t; sātk- twist/sētč twist solid object; (t)šēl- keep, take care of/šēl take care of (Ka č-šēl watch, guard); šēl- surround/šēl surround by enemy; kač- cut/čēl cut off completely; čēs- salvage, pick up (pl.)/čēs collect by pecking, salvage (Ka čas- consume all of; kāst/čēs(t) bad (Ka čēs-, Cv kāst); qēs/-qēs scratch with nails; qēsp past, long time, old/qēsp long time, long ago (Ka qaslp late); xāst/xēs good, well (Ka, Sp xēs(t), Cv xāst, Ch xēste); qēs blur, blurry, dim/qēs blurred, foolish; kāsan/čēsan head-louse; xāc-/xēc bet (Ka xč-); qēcp/qēc tight, shrunk, shrivelled; pāckel leaf/pēcčle leaf, cabbage (Ka plčē+ leaf, cabbage); tāc-/tēc flat objects lie (pl.); mac-/mēc grease; kēc-/čēc long object lies (Ka ċfč); pān-/pēn long objects lie (pl.) (Ka pān); tān/tēn tight, stretched; kānp/-čēnp clasp, encircle (Cv kānp-); wānt down, low/qēn below, deep, low; pān/-pēn bend (Ka pān); xān/-šēn flat object lies (Ch šānā's- lie on back); šāhentk/s-rīhent Canada goose; kwkʷatən?/kwf'ten mouse (Ka kwkʷten?); xāl/-xēl lay evenly (Ka xal- cover with planks or rugs); cēl/-čēl stand (Ka ċfč, Ch cēlap stand up); sēlp/-sēlp spin (Ka sēlp somersault); xālk- spin, turn/šēlč move in a circle (Ka šalč turn around); xʷāl-/xʷēl live, alive (Ka xʷu1xʷfl); qēl/-qēl fresh; xēl clear/xēl clear, bright, light (Ka xāl- daylight); tēl/-tēl soft object breaks (Ka tēl break); tēl/-tēl tear, rip (Ka tēl); kwēl warm/kwēl hot, sunny, warm (Ka, Sp kwf'l-, Cv kwēlt); qēlxʷ hang down/ qēlxʷ hook over, into (Ka qalxʷ hang up high on hook); skwēl/s-kʷu-kwēl porcupine (Ka skwēl, Cv kwēqan); pāt/-pēt thick (Ka, Sp pfl(t), Cv pē+t, Ch pē+t); tēl/tēl straight, right (Cv te+tē+t); stē+om/
27

s-tétem boat (Ka, Sp stétem, Cv stétem); xék' level, lose/shét beat in
contest, level (Ka š’k); k’wék'- take out of/kw'é' expose, be evident,
plain; qék' top of a hill/qétp go up incline; pélk'- turn over/pélé'
turn flat things over (Ka pélc' turn, Ch pélé'- turn over); xéléx'/
xélex' tooth (Ka, Sp xéléx'); cél' stand/cél' plural long objects stand
up, project; q'él'-qw'é' enkindle, light (Ch qwáil? pitch, light);
moláyén/mé'e' bait; xelispál'-/xelispím Kalispel (Ka xalispé); két-
part, divide/cél separate, divorce, part; cák' hit by throwing/céč
thunder strikes; cál'-céč count; xák'kák'/tékíc Brewer's blackbird;
lék' tie up/léč bind (Ka léč- tie); ték'kóm bobcat/pék'kón lynx (Ch pačóm
bobcat); ték'kés sweet (Ka, Sp tís, Me tóx); sxék-ákst/séč-čét black
moss; kóx'-t walk on the road/ččš-íp accompany, walk behind; wex-
qwéš comb; tókw quiet, silent, stuffy/tékw' stuffy; ték'p/ték'-p choke,
smother; cák'-cékw pull, drag (Ka ckW-); ték'kál/ték'-e? ball;
cák' stiff, tcugh/cék' stiff (as bones); pék'- drift/pék'-wind-blown;
tóx' add a piece/tox' add to a store; léx'p get hurt/léx'(p)
hurt (Ka lx'up hurt); lxw'- make a hole/léx' perforate, hole; tóx'/
+léx' sew; láx'- dead (pl.)/tx'- die, kill (pl.); lék't- far, wide/
lék' far (Ka lk'- far, distant); nák'-/nék'-e? one (Ka nkWú?, Ch

G. Irregular, unexplained correspondences

1. On ø, Cr i
tém' blank/tém' ground is clear of snow (Ka tí?im melt); xoẘít- oldest/
š’ít first, oldest (Ka š’ít first); melk' round/mílk' round, whole,
entire (cf. Cr melk' round, whole, entire; Ka melq' round); sél round/
síl turn, cause dizziness; cá+t cold/cí+ weather is cool (Cv cá+t cold); stékcxʷ/s-tékcxʷ red willowberry.

2. Cm ø, Cr ø
γέχ- herd, chase/déχ round up (cf. Cr déχ drive many, round up animals); téχʷ still/téχʷ stop shaking; téχʷp-/téχʷ stop; lέχʷ/lέχʷ draw on, make fit (Ka léw-, Cv lεw-, lεw-); sχwέχʷ/sχwέχʷ stop fox (Ka χwεχʷ, Sp sxwo·χwó, Cv χwεχʷíx, Sh χwεχʷíx).

3. Cm ø, Cr i
téwxe/itéśó? sneeze (Ka téso?).

4. Cm ø, Cr u
té+t/út+ dirty (Ka, Sp, Cv tí+); téχʷ+/úkʷ remember (Ka tékʷu-).

5. Cm ø, Cr ø
'çam-/scám suck (Ch 'cam- suckle); lékwo'sú/lqwo'sú pig (Ka lko'só pork, Me lko'só pig); 'cár sour, salty/cár sour (Ka cól salt, sour, Cv cól sour, cárt salt(y)).

6. Cm ø, Cr ø
kwél red, bay/kwél red (Ka, Sp, Cv kwél red).

PIS *ø (probably epenthetic)

A. Becomes Cm ø, Cr i in free variation with ø before dentals and alveopalatals
lεtkwú/lútkwú otter (Ka, Sp, Cv ltkwú); póčał leaf/péčíte? leaf, cabbage (Ka póčíte leaf, cabbage); qqíxʷax sucker/qíxʷilʃ fish; kókšak/téčič Brewer's blackbird.

B. Becomes Cm ø, Cr u in free variation with ø in the environment of
labials and labialized consonants

scú+em bull, bull elk/cu+um buffalo (Ka, Sp, Cv scú+em bull); tawen-+ce?/tfwun-+ce? doe (Ch tawen+ce); wónáx'/g'uniix' true, right; ?akwén/ñ'kwil fi+h eggs; syex'mús north wind, blizzard/yux'mús Cold.

C. Remains elsewhere regularly in both Cm and Cr

teméméy dead/tém-tamnéi corpse, dead (Ka tambémnéi corpse); sqaltémixw man/sq'ítemxn man, husband (Ka, Sp, Cv sqaltémixw man, husband);
sté+em/s-té+em boat (Ka, Sp stfe+em, Cv sté+em); sá?stem woman's brother-in-law, man's sister-in-law/sí?stem man's brother's wife, wife's sister; sxwusém/s-xusém foamberry (Me sxwúsén); yílemixw'om/yílmíxw'om chief (Ka, Sp, Cv yílemix'um); p'okem bobcat/péčen lynx (Ch pácém bobcat); pétwínxw old woman/s-pétwínuxw head of a nest, brood, household (Me ptawínxw old woman); cáso'lusá?/s-č-os-lúse? hail (Ka ssalúse?); 'q'emcawýa'/q'ucw'ecwiýc chipmunk (Ka qwe'cuwe, Ch q'we?e'c'et); sxwilaksan/s-xwil-ísčen big buck; ?í+en/?í+en eat (Ka, Sp, Cv ?í+en, Ch ?é+en); smúc'xen mare/s-m-múc'sen female animal, mare; syúmcen rival/sdímcen relative-friend; sáp'en/sfpen daughter-in-law (Me sfp'en); cáxalícan martén/caxuy'cén mink (Cv caxalícan? martén); kásan/céson head-louse; spáksmen/s-pís-men pestle; s-na-tús-men/s-č-tús-men eye; púlpulqen/pólpolgén thimbleberry; 'q'úm-qen/'q'úm-qen head (Ka, Sp q'úmqen hair on head, Cv qwe'omqen antlers); stríqxen/s-tareq-šen mudhen (Ka steláqsšen, Cv stereqxen); stí?fcxen/s-tuíč-šen killdeer; scú?-xen/s-cú?-šen leg, foot (Ka, Sp scu2šín, Cv scu?xán); yaxwíx'útxen/yax-yax-útšen badger; k'wámk'múc'xon/s-k'um-k'um-ñwutšen rainbow (Cv sk'wámk'mémcxen); cąynmén/cánmén Chinaman; melqños/
melaqnups golden eagle (Ka, Sp, Cv melqanups eagle); wolwelm iron, metal/wolwelm money, valuables (Ka, Sp u·lu·lím money, iron);
n'tel-ánaʔ/?en-telláneʔ wolf (Cr form probably borrowed from Ka; Ka nteláneʔ glutton); sxwəlúiqs cottontail/s-xwəl-átqan jackrabbit (Ka sxwəlóiqs prairie rabbit, Me sxwəlúiqs cottontail); in suffixes -ápqən/-ápqən back of head; -nwálen/-ingwílan something; -áxən/-áxən arm.

Various generalizations can be drawn from this material apart from the vowel changes themselves. (1) It is the following, not the preceding, consonant that affects vowel quality. Labials and labialization may occasionally provide counterexamples, but no pattern of this was detected. Pharyngeals, however, can affect the quality of a following vowel. (2) Uvulars, r, and pharyngeals (back consonants) can be preceded only by a, e, or o in Cr. 15 (3) The č/k, kʷ series may not be preceded by a or e in Cr. (4) Cm ø does not occur before y or y. (5) Cr i is very infrequent before labials. (6) Cr u does not occur before the č series in the same morpheme (but does occur before the kʷ series), uvulars, r, or pharyngeals, and Cm u does not occur before the k series, r, or pharyngeals. The significance of (5) and (6) is not clear. It is not unlikely that PIS *k k x were labialized after *u to *kʷ kʷ xʷ, thus eliminating these three consonants from this environment. This does not explain the lack of r and pharyngeals after u in Cm, however (but this may not be a significant lacuna, since none of these are very frequent consonants in any case.

4. A word about consonant correspondences is in order. There are
few consistent differences between the consonants of Cm and Cr. PIS *k k x have remained in Cm, and regularly become č ĝ š respectively in Cr (as well as in Sp and Ka). Cr has merged PIS *k with *t, whereas Cm has kept them distinct. Cr has four voiced stops, but whether these are original or derived is uncertain; no pattern has been detected to indicate how they might have developed. Cr b corresponds to Cm p, although only one non-borrowed cognate pair is known (the sound is quite uncommon in Cr in any case). Both Cr d and j correspond to Cm y; Cr j is infrequent. Cr gʷ corresponds to Cm w. (Cr is the only IS language with voiced stops, and they contrast there with the resonants to which they correspond in the other IS languages; the correspondences in the other languages are the same as in Cm.) Cm has developed two more pharyngeals than occur in the other languages; PIS *č and *ťʷ have split there into voiced-voiceless pairs: Cm č h č w hʷ.

Other Cm-Cr consonant differences are sporadic. The most striking, perhaps is Cm p/Cr č. This correspondence has been found in only three pairs of cognates (palán/ččl tree bark; pún-tp/?ačačn-ά+qʷ juniper; t³-ίč ċ protrude), but is more widely known elsewhere in Salish. Since Cr č is known to have developed from PIS *k, a Cm k/Cr p correspondence would not be inconceivable (the č/p correspondences do not seem to be entirely one-way wherever they occur), and the pair Cm wərʷarkά+t p tall sunflower/Cr sgʷárʷom flower might be an instance of this (in the Cm form the initial wər- is, of course, a reduplication of the root wark-, and -ά+t is a lexical suffix meaning plant; in the Cr form s- is the common Salish nominalizer, and -əm is a common suffix called causative by Reichard).
Occasional Cm /Cr n correspondences occur: sṭūlcaʔ/s-tūn+čeʔ *mule deer; tūplaʔ/tūpen spider. The reverse correspondence also occurs: smánxʷ/mílxʷ *smoke tobacco; ḥoʔen/ʔihul *fish eggs. Other consonant correspondences are even more random, such as Cm kʷul- borrow, lend/Cr kʷul- lend (although morphophonemic alternations between l and + in any given language are known to occur). There are several instances of velars differing as to front-back, rounded-unrounded, glottalized-unglottalized (or combinations of these); differences in glottalization of other consonants, especially resonants; differences in presence or absence of ?, and differences in presence or absence of y, especially adjacent to i.

5. The above reconstructed vowels shed interesting light on IS ablaut. The only place this phenomenon has ever been discussed in print is in the works of Gladys Reichard (Vogt mentions a type of ablaut, but this is quite a different matter), particularly her article "Composition and symbolism of Coeur d'Alene verb stems." However, in this article, Reichard treats this ablaut (which she never calls by that name) as "vowel symbolism," and is unable to draw either convincing or consistent conclusions. Most of what she considers the secondary forms she believes are causatives or resultatives (the "primary meaning... indicates that a thing has quality or is in a given condition automatically or without an outside force or agent"; the secondary meaning is that "the subject has been made or caused to act or to assume a condition by an outside agent." But there are other pairs which are antonyms, and do not fit her causative-resultative category. As to the vowels, she says that ā u y a (these are her symbols; her ā equals our e, and her y should be ø) occur as primary
vowels and $i$ and $a$ and $o$ ($e$ should be included too) as secondary, paired as follows: $e-i$, $e-a$, $a-i$, $a-o$, $u-e$, $u-a$, $o-i$, $u-o$.

Upon close examination, this all becomes quite confusing, but we believe that relatively simple and systematic explanations are possible. First of all, many of the pairs of words Reichard gives are probably not related at all. With CVC as the predominant root pattern, pairs differing only in the vowel are highly likely, and no relationship between them need be sought. Such pairs as $t\text{ek}w$ be stuffy - $t\text{ik}w$ smell out, detect, $\chi\text{mac}$ pass by - $\chi\text{mic}$ crop hair, $\text{cem}$ press hard on - $\text{cam}$ be pointed (like a lemon) are probably not related. Others, such as $t\text{ek}w$ one lies - $t\text{ik}w$ be old, or $\text{EC}$ flat objects lie - $\text{AC}$ one drop falls she herself questions. But there are plenty of pairs which surely are related, indicating that ablaut has been a viable process in IS.

Secondly, the causative-resultative meaning assigned to these pairs is probably not relevant. At one point, Reichard says that the secondary forms "generally take $\ddot{a}ts$- made so," and it is most likely this prefix, rather than the vowel change, that gives the causative-resultative meaning. With this out of the way, we can say that ablaut creates forms with a derived or secondary meaning, but see no need to try to assign concrete meaning to the process. This avoids problems with the so-called antonyms.

Finally, the classes of ablaut types are needlessly complex. Most of the types given by Reichard were illustrated by only a few pairs of words; by eliminating those pairs that are unlikely to be related, we can eliminate $a-o$ as a type altogether. Figures for the other pairs (keeping all that can be thought to be related, even by an active imagination)
are: ε-ι 27, ε-α 11, α-ι 5, u-ε 2, u-α 1, e-ι 2, u-ο 3. We believe that
even this number of ablaut types is greater than that present in PIS, the
increase (and realignments) being a result of sound changes discussed
above.

5.1. At this point, it will be convenient to have the data before
us. The following are those pairs given by Reichard (retranscribed into
the notation explained and used in the earlier part of this paper) which
we will allow may be related (some, of course, may not be, nor should this
list be considered exhaustive for Cr).

(1) u

\begin{align*}
\text{puxw} & \quad \text{blow with mouth} \\
\text{qwus} & \quad \text{be gathered by sewing} \\
\text{ply} & \quad \text{press} \\
\text{pilce} & \quad \text{turn eyes inward with pain} \\
\text{min} & \quad \text{smear grease} \\
\text{miy} & \quad \text{be made clear} \\
\text{miy} & \quad \text{be dignified} \\
\text{mi+} & \quad \text{rest} \\
\text{wilce} & \quad \text{make roll} \\
\text{tixw} & \quad \text{gather, collect} \\
\text{tilp} & \quad \text{split off portion} \\
\text{tim} & \quad \text{tear cloth from bolt} \\
\text{nikw} & \quad \text{be tribe} \\
\text{sitce} & \quad \text{stomach}
\end{align*}

\begin{align*}
\epsilon & \\
\text{pexw} & \quad \text{winnow, wind blows} \\
\text{qwes} & \quad \text{be shrivelled} \\
\epsilon & \\
\text{pey} & \quad \text{milk} \\
\text{pelce} & \quad \text{turn flat object over} \\
\text{men} & \quad \text{rub} \\
\text{mey} & \quad \text{be evident} \\
\text{mey} & \quad \text{arrange} \\
\text{met+} & \quad \text{persons lie} \\
\text{welce} & \quad \text{roll} \\
\text{texw} & \quad \text{add to store} \\
\text{tel} & \quad \text{soft object or piece breaks off} \\
\text{tem} & \quad \text{slide scissors through fabric} \\
\text{nekw} & \quad \text{be one} \\
\text{setce} & \quad \text{second stomach, paunch}
\end{align*}
<table>
<thead>
<tr>
<th>si</th>
<th>become turned, cause dizziness</th>
</tr>
</thead>
<tbody>
<tr>
<td>či</td>
<td>be nauseated</td>
</tr>
<tr>
<td>ěd</td>
<td>shade (tr.)</td>
</tr>
<tr>
<td>ěš</td>
<td>be weir</td>
</tr>
<tr>
<td>kwč</td>
<td>take off (as clothes)</td>
</tr>
<tr>
<td>qč</td>
<td>wake up</td>
</tr>
<tr>
<td>ću</td>
<td>have pity for</td>
</tr>
<tr>
<td>qwi</td>
<td>light fire</td>
</tr>
<tr>
<td>ćwi</td>
<td>blacken</td>
</tr>
<tr>
<td>qwič</td>
<td>be preserving</td>
</tr>
<tr>
<td>ćt</td>
<td>make stripe</td>
</tr>
<tr>
<td>ćtp</td>
<td>plural jump</td>
</tr>
<tr>
<td>ćtкw</td>
<td>cause to jerk</td>
</tr>
<tr>
<td>ćt</td>
<td>be even with edge</td>
</tr>
<tr>
<td>nwč</td>
<td>break into smile</td>
</tr>
<tr>
<td>će+iy</td>
<td>spotted</td>
</tr>
</tbody>
</table>

(3) a

pac | squirt |

cas | fine |

(4) e

peq | be white, bleached |

leq | bury |

tex | it stops moving |

<table>
<thead>
<tr>
<th>sel</th>
<th>turn swiftly</th>
</tr>
</thead>
<tbody>
<tr>
<td>če</td>
<td>cough up</td>
</tr>
<tr>
<td>ěd</td>
<td>be shady</td>
</tr>
<tr>
<td>ěš</td>
<td>comb</td>
</tr>
<tr>
<td>kwč</td>
<td>be exposed</td>
</tr>
<tr>
<td>qč</td>
<td>be awake</td>
</tr>
<tr>
<td>ću</td>
<td>poor, pitiable</td>
</tr>
<tr>
<td>qwi</td>
<td>kindle</td>
</tr>
<tr>
<td>ćwi</td>
<td>be black</td>
</tr>
<tr>
<td>qwič</td>
<td>have endurance</td>
</tr>
<tr>
<td>ćt</td>
<td>mark</td>
</tr>
<tr>
<td>ćtп</td>
<td>one leaps</td>
</tr>
<tr>
<td>ćткw</td>
<td>jerk</td>
</tr>
<tr>
<td>ćтев(н)</td>
<td>be there, opposite</td>
</tr>
<tr>
<td>ćтш</td>
<td>smile</td>
</tr>
<tr>
<td>ćеу</td>
<td>make dirty marks, scribble</td>
</tr>
</tbody>
</table>

| i | |

<table>
<thead>
<tr>
<th>pic</th>
<th>squeeze, push</th>
</tr>
</thead>
<tbody>
<tr>
<td>cis</td>
<td>slender</td>
</tr>
<tr>
<td>xič</td>
<td>fear, be afraid of</td>
</tr>
<tr>
<td>xič</td>
<td>hurry at</td>
</tr>
</tbody>
</table>

| a | |

<table>
<thead>
<tr>
<th>paq</th>
<th>be whitened</th>
</tr>
</thead>
<tbody>
<tr>
<td>laq</td>
<td>search for, unearth</td>
</tr>
<tr>
<td>txačw</td>
<td>cause to stop, bring to a stop</td>
</tr>
</tbody>
</table>
Because of the vowel changes which occurred between PIS and Cr, we account for the Cr pairs listed above as follows: (1) u would alternate with e (from PIS *a) in the two forms given. (2) The large class i-e is a merger of PIS *a-e and *i-e, as can be seen by comparison of primary forms with Cm, when available. Both PIS *a and *i would most commonly become Cr i. That both origins are present in this list is shown by the Cm/ Cr pairs 'q wi- black/q wi'd blacken, 'q wi'y/q wi'd black (Cm i from PIS *a before y); 'k wi- take apart, take off/'k wi' take off clothes, 'k wi'- take out of/'k wi' expose, be evident, plain. We cannot at present tell what the
source of all these pairs is, i.e., whether they are from PIS *a-ǝ or *i-ǝ since we do not have cognates for all the forms. (3) The Cr a-i alternates do not fit our PIS pattern. (4) The e-a pairs are also properly from PIS *i-ǝ: *i becomes Cr e and *ǝ becomes Cr a before uvulars. (5) i alternates with ǝ in two forms. This is not expected because PIS *ǝ should become Cr ǝ. These both have phonetically [u]; however, even this is not explainable at this time. It is possible that the forms are borrowed. (6) The three alternates with u-ǝ do not fit our scheme either. ǝ in Cr developed from *u before r, uvulars and pharyngeals, except in a very few roots. (7) A problem also arises within our final group, a-ǝ. The a of these forms is unexplained—if original, it would have been expected to have become i. This is the only group of any consequence which we have not been able to explain. But as stated above, the ablaut variant of primary *ǝ is not clear. It is possible that this large class of Cr pairs is the reflex of this missing ablaut type.

5.2. A somewhat superficial check of Cm data confirms these hypotheses about PIS ablaut. Precisely the expected pairs occur. Since Cm retains the reconstructed PIS vowels except PIS *ǝ before y, we would expect Cm a-ǝ, i-ǝ, and u-ǝ, plus a/i/u-i before y. We find the following:

(1)  a  e
    ǝ

     'cár  salt     ǝ  cár  sour, salty
   ǝ́q-  stretch a hide  ǝ́q-t  wide  (questionable pair)
     ǝ́m-  end of, finish  ǝ́m-  pass, go by
   ǝ́náʔ  rot, rotten meat  ǝ́ná  rotten meat or fish
     ǝ̲pá̲c̲ə̲n  spider-web, rope  ǝ̲pá̲c̲  excrement (soft)
qácp - curl up (as a snake)
qákp - get on top (of a mountain)
ráx - animal chews
sá?xw - melt
táxw - still
xár - spread flat
xát - lift

(2) a
páyq - white
máya - tell
qwy-än - blacken
ráym - angry

(3) i
kít - break string or wire
kwíx - take apart
líf - break string or wire
lífw - rosary
síq-ämän - splitting maul
tíl - break or pull apart (bread)

(4) u
púxw - blow (on)
yúw - untie

There is another ablaut pair in Cm, é-ä, the status of which is not clear. It seems to be developed for a different reason from the above, all of which are derivational in some general manner. Pairs with é-ä are
also derivational, but the source of the ablaut does not seem to be derivational, but rather the result of it. In all cases of Cm ē-ā, stress is shifted to another element in the word (usually a suffix): kān-ēn up against - kān-qín pillow (-qín head); tēc- hit with a stick or whip - tācc-dālps hit on the head (-dālps back of neck). Cm ē has an ambivalent status in any case, as implied above (section 4); unstressed ē is most commonly epenthetic. This being the case, there may be an effort to avoid unstressed ē in positions where it would not occur epenthetically, and when resulting from a stress shift away from a root with stressed ē. Cm ē-ā would then be a later development than the other ablaut types.

5.3. Further confirmation is obtained from those few ablaut pairs retrievable from Vogt's Kalispel dictionary. Only seven or eight such pairs can be found, and these represent either PIS *a-ê or *i-ê:

(1) *a
   cāw- wash
   kâĉ- stick out
   qwāĉ- hat; make warm
   xás- "good dress" ?
   xwāl- make a movement, step
   yāl- round circle, hole

(2) *i
   mīy- know, find out
   pīq white

5.4. Most of these forms can be traced back to PIS (with the aid of cognates from other languages) to show that PIS probably had a simple,
consistent ablaut system. It would appear that each of the three primary
vowels i u a had e as their ablaut variant. The ablaut variant of primary
e is unclear. Any of the four vowels could also vary with zero, perhaps
secondarily to the e-grade, and only when stress had been shifted away
from the root of the word.

But we find no clear evidence which would indicate what the ablaut
grade of PIS *e might have been comparable to PIS *a-e, *i-e, and *u-e.
One possible conclusion from this might be that PIS *e was secondary, and
always derived by ablaut from one of the other vowels, *a, *i, or *u. This
is questionable, however, because of the large number of forms which must
be reconstructed with PIS *e, and for which no ablaut source is extant.
We must leave the solution to this problem to further and broader compa-
rative work.

Another ablaut grade does exist, however: zero. Again with shift
of stress away from the root, vowels often disappear altogether: (since
this is a very common phenomenon, only a few examples are given) Om cát-
cold - c+ùluxw cold country; kwârən apply yellow paint - kw-r-ayq yellow;
+sət wide - s-q-âlqw wide board; həxt fast - həx-âtkw rapids, fast water;
'pəkət big around - pkw-áp big rope; təs stiff, hard - t-s-ápca? hard, poorly-
tanned leather; Cr hən̂səgùl road - hən̂sašgùlí little road, path; ?əse l
two - ?eʔsíʔí little two; həncəxwùt stream - həncəcxwùt streamlet. One
might take this as the ablaut grade of PIS *e, but since all vowels are
affected, one would have to assume an intermediary e-grade in each case.
There is no evidence for this, and it is both unlikely and unnecessary.
There is also a lengthened grade of PIS *e, *i, and *u (but probably
significantly, not *ə), which offers no particular complications, and may
be at least partly inflectional rather than derivational, and which will
not be discussed further here.

5.5. To summarize ablaut in PIS, then, we present the following
chart showing the various ablaut grades and their developments into Cm
and Cr. The different possibilities of ablaut vowels are given for Cm
and Cr, but conditioning factors are not repeated here. Vowel grades
indicated by number are (1) lengthened, (2) normal, (3) ə, (4) zero.

<table>
<thead>
<tr>
<th>PIS</th>
<th>Cm</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>a• a ə φ</td>
<td>a• a ə/i φ</td>
<td>a•/i• i/a/ε ε/a φ</td>
</tr>
<tr>
<td>i• i ə φ</td>
<td>i• i ə/i φ</td>
<td>i• i/e ε/a φ</td>
</tr>
<tr>
<td>u• u ə φ</td>
<td>u• u ə/i φ</td>
<td>u• u ε/a φ</td>
</tr>
<tr>
<td>ə φ</td>
<td>ə/i φ</td>
<td>ε/a φ</td>
</tr>
</tbody>
</table>

In several cases the difference between the normal and ə-grade forms will
be leveled out by vowel changes, and the possibility of ablaut in the first
place can only be adduced by semantic variability of a form or by compari-
son with other Salish languages.
FOOTNOTES

1. The research which provided the data for this paper was made possible by grants from the Phillips Fund of the American Philosophical Society and from the University of Kansas for work on Columbian, and from the National Science Foundation, the American Council of Learned Societies, and the University of Washington for work on Coeur d'Alene. This assistance is gratefully acknowledged. We also wish to thank Dr. James E. Hoard of the University of Kansas for his many helpful discussions and suggestions.

2. E.g., Boas, Reichard, Swadesh.

3. The following abbreviations will be used: CS - Coast Salish, IS - Interior Salish, PIS - Proto-Interior Salish, Cr - Coeur d'Alene, Cm - Columbian, Ka - Kalispel, Sp - Spokane, Cv - Colville, Me - Methow, Li - Lillooet, Th - Thompson, Sh - Shuswap, Fl - Flathead, Ch - Upper Chehalis.

4. A few of these come from field notes of Kinkade. The vast majority are from Hans Vogt, The Kalispel Language, Oslo (1940), and Hans Vogt, Salishan Studies: Comparative Notes on Kalispel, Spokan, Colville, and Coeur d'Alene, Oslo (1940).


8. Ibid.

9. Ibid., p. 128


12. **Epenthetic** is used here with its usual meaning. Most simply, epenthetic *a* is one which would not appear in a morphophonemic or reconstructed form, and which can be (synchronically) predicted by a few simple (low-level) rules. Epenthetic *a* is most commonly found before resonants, but not exclusively so. To eliminate it entirely from transcriptions might seem arbitrary, since it is qualitatively the same as other *a*'s, but seems structurally valid, or even necessary. Most unstressed *a*'s can be thus eliminated, but some seem to be necessary. Further study is needed to clarify this problem fully.

13. In Kinkade's opinion, the first of these two alternatives is the simpler. The vowel alternations that seem to be relevant to this point are not the ablaut discussed below (involving semantic changes), but vowel differences under reduplication. But this is a special problem which needs separate investigation. The great amount of apparent irregularity in reduplications cannot be quickly summarized for inclusion in this paper. However, one possibility is that PIS reduplications treated vowels in three ways: (1) any full vowel alternating with itself, regardless of stress (i.e., either or neither vowel may have been stressed); (2) any full vowel, stressed or unstressed alternating with *a* (unstressed) in either order; (3) any full vowel, stressed or unstressed, alternating with zero in
either order. This provides 11 vowel patterns in PIS reduplication (disregarding stress), which could yield as many as 30 patterns in Cr, excluding the many duplications that occur from Cr vowel changes. This theory will account for vowel patterns in Cm reduplication and for all in Cr reduplication except those with a vowel alternating with Cr e (unstressed). Because of the overwhelming symmetry and regularity which otherwise occurs, I suggest that these exceptions in Cr are innovations made since PIS times.

(MDK)

14. Upper Chehalis forms are from Kinkade's field notes.
15. Cf. Reichard, Coeur d'Alene, p. 561:203. But in her 1959 work, several forms are given with e before uvulars; only one Cm cognate was found for these, and that was Cm ëq- bury, indicating that at least some of this group should have Cr ë rather than e.
16. IJAL 11.47-63 (1945).
17. Ibid., p. 49.
18. Ibid.
19. Cv. zero as an ablaut grade in Ch, in Kinkade, Vowel alternation in Upper Chehalis, IJAL 32.343-349 (1966). Most other ablaut in Ch is too fragmentary to be of much use in our comparisons here.